

EH Resident Competency 1.17

Competency 1.17 EH Residents shall demonstrate a working level knowledge of safety precautions and hazards associated with chemicals, compounds, and compressed gases.

1. Supporting Knowledge and Skills

- a. Discuss the hazards associated with the use of corrosives (acids and alkalies).
- b. Describe the general safety precautions necessary for the handling, storage, and disposal of corrosives.
- c. Discuss the general safety precautions for toxic compounds.
- d. Given a list of compounds, apply appropriate criteria to determine if a compound is a health hazard and discuss the methods by which toxic compounds may enter the body.
- e. Discuss the safety precautions for working with cryogenic liquids.
- f. Describe the general safety precautions regarding the use, handling, and storage of flammable and combustible materials.
- g. Given a specific scenario involving a combustible/flammable material spill, describe the required response. Include containment and notification actions.
- h. Describe the requirements for safe storage and use of the following compressed gases (include flammability and cryogenic considerations):
 - Oxygen
 - Acetylene
 - Hydrogen
 - Nitrogen
- i. Describe the general requirements for the storage of hazardous chemicals (toxic, reactive, and corrosive). Include in your discussion venting/ventilation, drainage, construction, and location.
- j. Given a specific activity involving hazardous chemicals, describe the specialized personal protective equipment required.
- k. Given examples of specific chemicals, discuss their compatibility and any potential hazards associated with mixing.

EH Resident Competency 1.17

- I. Describe the safety considerations and hazards associated with the following asbestos-related activities:
- Removal or encapsulation
 - Spill and cleanup
 - Transportation, storage, or containment
 - Disposal

2. Self-Study Activities (corresponding to the intent of the above competency)

Below are two web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://wastenot.inel.gov/cted/stdguido.html	DOE Standards, Guides, and Orders
OSHA	http://www.osha-slc.gov/	OSHA documents and search engine
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations

Review 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response*, and NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*.

EXERCISE 1.17-A Referring to 29 CFR 1910.120, describe the general hazards associated with corrosive material, providing examples of both types of corrosives.

EXERCISE 1.17-B Referring to NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*, what are the general incompatibilities and reactivities for the following corrosive materials?

- nitric acid
- sulfuric acid
- anhydrous ammonia
- sodium hydroxide

EH Resident Competency 1.17

EXERCISE 1.17-C Referring to NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*, what are the general personal protection precautions one must take with the following corrosive materials?

- nitric acid
- sulfuric acid
- anhydrous ammonia
- sodium hydroxide

EXERCISE 1.17-D What are the primary routes and methods of the entry of hazardous chemicals into the human body?

EXERCISE 1.17-E Referring to 29 CFR 1910.120, in the context of hazard identification, define risk assessment.

Scan the tables of contents in 29 CFR 1910.119, *Process Safety Management of Highly Hazardous Chemicals*.

EXERCISE 1.17-F Referring to 29 CFR 1910.119, what are the general elements of a process safety management program that must be implemented when dealing with a highly hazardous chemical?

Read 29 CFR 1910.1200 (e), "Written hazard communication program."

EXERCISE 1.17-G Referring to 29 CFR 1910.1200 (e), what are the general elements of an employer's hazard communication program?

Scan 29 CFR 1910.101, *Compressed Gases*; 29 CFR 1910.102, *Acetylene*; 29 CFR 1910.103, *Hydrogen*; 29 CFR 1910.104, *Oxygen*, and NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*.

EXERCISE 1.17-H What are the three basic hazards associated with compressed gas cylinders?

EXERCISE 1.17-I Referring to 29 CFR 1910.102 and NIOSH Publication 94-116, what are the health hazards associated with exposure to the compressed gas, acetylene?

EXERCISE 1.17-J Referring to 29 CFR 1910.103 and NIOSH Publication 94-116, what is the placarding required marking for permanent storage areas for the compressed gas, hydrogen?

EH Resident Competency 1.17

EXERCISE 1.17-K Referring to 29 CFR 1910.104 and NIOSH Publication 94-116, what is the required distance between compressed oxygen storage systems and fire-resistive buildings?

Review 49 CFR 171.14, “Transitional Provisions for Implementing Requirements Based on the U.N. Recommendations,” and OSHA Standard 2202, Section 21, *Flammable and Combustible Liquids*.

EXERCISE 1.17-L Referring to 49 CFR 171.14, what is the difference between combustible liquids and flammable liquids?

EXERCISE 1.17-M Referring to OSHA Standard 2202, describe the general safety precautions regarding the use, handling, and storage of flammable and combustible materials.

EXERCISE 1.17-N Referring to 29 CFR 1910.106, what are the emergency venting requirements for portable storage tanks of flammable and combustible liquids?

EXERCISE 1.17-O Referring to 29 CFR 1910.106, under what circumstances is hot work (e.g., welding or cutting) permitted in a processing plant that contains storage tanks of flammable or combustible liquids?

Read DOE Order 232.1, *Occurrence Reporting and Processing of Operations Information*; **read** DOE Order 5500.2B, *Emergency Categories, Classes, and Notification and Reporting Requirements*; and **read** pages 1 through 9 in the “Guidance for Event Classification and Emergency Action Levels” in U.S. Department of Energy, Office of Emergency Planning and Operations, *Emergency Management Guide*.

Read the following scenario (adapted from an article in *Occupational Safety Observer*, June 1993 issue) and answer the questions posed in the exercises.

Workers at a chemical distribution company (a DOE contractor) were preparing to empty 20,000-gallon chemical storage tanks for relocation. They were removing the connecting catwalks and ladders using oxygen-acetylene cutting torches, when one of the tanks exploded, lifting it about 30 feet in the air and killing several workers.

EXERCISE 1.17-P Because you were in the vicinity and the first one to respond, what are your immediate actions?

EXERCISE 1.17-Q What is the proper classification of this event, and why?

EH Resident Competency 1.17

EXERCISE 1.17-R What are the requirements for oral and written notification by the site/facility to DOE for unusual occurrences?

EXERCISE 1.17-S What are the requirements for oral and written notification by the site/facility to offsite agencies (regional, federal, state, tribal, and local) for unusual occurrences?

Read Chapter 8, "Personal Protective Equipment (PPE)," of NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*; **scan** Subpart I, "Personal Protective Equipment," of 29 CFR 1910, *Occupational Safety and Health Standards for General Industry*; and **read** 29 CFR 1910.120 (g), Engineering controls, work practices, and personal protective equipment for employee protection, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

EXERCISE 1.17-T Referring to paragraph (a) of Subpart I, 29 CFR 1910.132, when shall personal protective equipment be provided and used?

EXERCISE 1.17-U Referring to Chapter 8, "Personal Protective Equipment (PPE)," of NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, what are the primary and secondary considerations when selecting protective clothing?

EXERCISE 1.17-V Based on EPA protective ensembles, complete the following table by giving at least two examples of recommended equipment for each level of protection.

Levels of Protection Ensembles		
Level	Protection Provided	Recommended Equipment
A	The highest available level of respiratory, skin, and eye protection.	
B	Same level of respiratory protection but less skin protection than Level A. The minimum level recommended for initial site entries until the hazards have been identified.	

EH Resident Competency 1.17

Levels of Protection Ensembles		
Level	Protection Provided	Recommended Equipment
C	Same level of skin protection as Level B, but a lower level of respiratory protection.	
D	No respiratory protection. Minimal skin protection.	

Read 29 CFR 1926.1101, *Asbestos*; 40 CFR 61, Subpart M, *National Emission Standard for Asbestos*; and NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*.

EXERCISE 1.17-W Referring to 29 CFR 1926.1101, what are the permissible exposure limits (both time-weighted average and excursion)?

EXERCISE 1.17-X Referring to 40 CFR 61.145, *Standard for Demolition and Renovation*, what are the required steps to prepare the regulated asbestos-containing material for disposal?

EXERCISE 1.17-Y Referring to 40 CFR 61.150, *Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations*, what are the requirements for wetting and preparing asbestos-containing waste for disposal?

EXERCISE 1.17-Z Referring to 40 CFR 61.150, *Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations*, what are the requirements for processing asbestos-containing waste into nonfriable forms?

3. Summary

(From *Fundamentals of Industrial Hygiene*)

The majority of the occupational health hazards arise from inhaling chemical agents in the form of vapors, gases, dusts, fumes, and mists, or by skin contact with these materials. The degree of risk of handling a given substance depends on the magnitude and duration of exposure. The required information about these chemical hazards can be obtained from the Material Safety Data Sheet (MSDS) that must be supplied by the chemical manufacturer or importer to the purchaser for all hazardous materials that are subject to 29 CFR 1910.1200.

EH Resident Competency 1.17

Explosives are those substances, mixtures, or compounds capable of entering into a combustion reaction so rapidly and violently as to cause an explosion. Corrosives are capable of destroying living tissue and have a destructive effect on other substances, particularly on combustible materials; this effect can result in a fire or explosion. Flammable liquids are those liquids with a flash point of 38°C (100°F) or less, although those with higher flash points can be both combustible and dangerous. Toxic chemicals are those gases, liquids, or solids that through their chemical properties, can produce injurious or lethal effects upon contact with body cells. Oxidizing materials are those chemicals that will decompose readily under certain conditions to yield oxygen. They may cause a fire when in contact with combustible materials, and can react violently with water or fire. Dangerous gases are those gases that can cause lethal or injurious effects and damage to property by their toxic, corrosive, flammable, or explosive physical and chemical properties.

The toxicity of a material is not synonymous with its being a health hazard. Toxicity is the capacity of a material to produce injury or harm. Hazard is the possibility that exposure to a material will cause injury when a specific quantity is used under certain conditions. The key elements to be considered when evaluating a health hazard are:

- How much of the material must be in contact with a body cell and for how long to produce injury?
- What is the probability that the material will be absorbed or come in contact with body cells?
- What is the rate of generation of airborne contaminants?
- What control measures are in use?

The effects of exposure to a substance depend on dose, rate, physical state of the substance, temperature, site of absorption, diet, and general state of a person's health.

4. Exercise Solutions

EXERCISE 1.17-A Referring to 29 CFR 1910.120, describe the general hazards associated with corrosive material, providing examples of both types of corrosives.

ANSWER 1.17-A (Any reasonable paraphrase of the following.) Corrosive hazards are substances that cause the deterioration of other materials. A corrosive may eat through and destroy metal, body tissue, plastics, and other materials. Corrosives can be acids or alkali and be in the form of solid, liquid, or gas. Great caution should be taken when working near corrosive materials; they burn on contact and breathing corrosive materials can cause life-threatening damage.

EH Resident Competency 1.17

Some common corrosives include chlorine, hydrochloric acid, nitric acid, sulfuric acid, anhydrous ammonia, and sodium hydroxide. The strength of a corrosive material is generally measured by how much its pH deviates from neutral (pH 7).

EXERCISE 1.17-B Referring to NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*, what are the general incompatibilities and reactivities for the following corrosive materials?

- nitric acid
- sulfuric acid
- anhydrous ammonia
- sodium hydroxide

ANSWER 1.17-B

- nitric acid - combustible materials, metallic powders, hydrogen sulfide, carbides, alcohols
- sulfuric acid - organic materials, chlorates, carbides, fulminates, water, powdered metals; reacts violently with water and produces heat
- anhydrous ammonia - strong oxidizers, acids, halogens, salts of silver and zinc; corrosive to copper and galvanized surfaces
- sodium hydroxide - water, acids, flammable liquids, organic halogens; corrosive to metals

EXERCISE 1.17-C Referring to NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*, what are the general personal protection precautions one must take with the following corrosive materials?

- nitric acid
- sulfuric acid
- anhydrous ammonia
- sodium hydroxide

ANSWER 1.17-C

- nitric acid - prevent inhalation of vapor, prevent skin contact, prevent eye contact, wash skin on contact, provide eyewash, quick drench
- sulfuric acid - prevent inhalation of vapor, prevent skin contact, prevent eye contact, wash skin on contact, provide eyewash, quick drench

EH Resident Competency 1.17

- anhydrous ammonia - prevent inhalation of vapor, prevent skin contact, prevent eye contact, wash skin on contact, provide eyewash, quick drench
- Sodium hydroxide - prevent inhalation of vapor, prevent skin contact, prevent eye contact, wash skin on contact, provide eyewash, quick drench

EXERCISE 1.17-D What are the primary routes and methods of the entry of hazardous chemicals into the human body?

ANSWER 1.17-D

Primary Routes and Methods of Entry	
Route	Description
Inhalation	Involves those airborne contaminants that can be inhaled directly into the lungs and can be physically classified as gases, vapors, and particulate matter, which includes dusts, fumes, smoke, aerosols, and mists.
Absorption	Chemicals can be absorbed through the skin and more rapidly through cut or abraded skin than through intact or unbroken skin. Some substances are absorbed by way of the openings for hair follicles, while others dissolve in the fats and oils of the skin. Some organic chemicals can produce systemic poisoning by direct contact with the skin.
Ingestion	When consumed, the toxic compounds are capable of being absorbed from the gastrointestinal tract into the blood.

EXERCISE 1.17-E Referring to 29 CFR 1910.120, in the context of hazard identification, define risk assessment.

ANSWER 1.17-E (Any reasonable paraphrase is acceptable.) Risk assessment is a determination of the probability that an adverse effect will be produced. Therefore, risk assessment is the basic device by which we should arrive at our decisions governing the handling, use, storage, and disposal of hazardous material.

EH Resident Competency 1.17

EXERCISE 1.17-F Referring to 29 CFR 1910.119, what are the general elements of a process safety management program that must be implemented when dealing with a highly hazardous chemical?

- ANSWER 1.17-F
1. Hazardous material analysis communications to employees
 2. Safety information pertaining to the chemicals, the technology of the process, and equipment used in the process
 3. Process hazard analyses conducted
 4. Operating procedures
 5. Training
 6. Prestartup safety review
 7. Mechanical integrity
 8. Change and modification control
 9. Incident investigation
 10. Emergency planning and response

EXERCISE 1.17-G Referring to 29 CFR 1910.1200 (e), what are the general elements of an employer's hazard communication program?

- ANSWER 1.17-G
1. A list of the hazardous chemicals known to be present
 2. The labeling of all hazardous chemical containers
 3. A material safety data sheet (MSDS) for each hazardous chemical
 4. Employee planning and training

EXERCISE 1.17-H What are the three basic hazards associated with compressed gas cylinders?

- ANSWER 1.17-H
- High pressures
 - Displacement of breathable air
 - Contents that burn or have other hazardous characteristics

EXERCISE 1.17-I Referring to 29 CFR 1910.102 and NIOSH Publication 94-116, what are the health hazards associated with exposure to the compressed gas, acetylene?

- ANSWER 1.17-I
- Inhalation - dizziness, asphyxiation
 - Eye and skin contact - frostbite

EH Resident Competency 1.17

EXERCISE 1.17-J Referring to 29 CFR 1910.103 and NIOSH Publication 94-116, what is the placarding required marking for permanent storage areas for the compressed gas, hydrogen?

ANSWER 1.17-J “HYDROGEN--FLAMMABLE GAS--NO SMOKING--NO OPEN FLAMES” or equivalent.

EXERCISE 1.17-K Referring to 29 CFR 1910.104 and NIOSH Publication 94-116, what is the required distance between compressed oxygen storage systems and fire-resistive buildings?

ANSWER 1.17-K 25 feet.

EXERCISE 1.17-L Referring to 49 CFR 171.14, what is the difference between combustible liquids and flammable liquids?

ANSWER 1.17-L A flammable liquid has a flashpoint below 60° C (140° F). A combustible liquid has a flashpoint above 60° C (140° F) and below 93° C (200° F).

Note: “Flashpoint” means that minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with the air near the surface of the liquid.

EXERCISE 1.17-M Referring to OSHA Standard 2202, describe the general safety precautions regarding the use, handling, and storage of flammable and combustible materials.

ANSWER 1.17-M From OSHA 2202, Section 21, “Flammable and Combustible Liquids” (any reasonable paraphrase of the following):

- a. Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids.
- b. No more than 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet. No more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet. No more than three storage cabinets may be located in a single storage area.

EH Resident Competency 1.17

- c. Inside storage rooms for flammable and combustible liquids shall be of fire-resistive construction, have self-closing fire doors at all openings, 4-inch sills or depressed floors, a ventilation system that provides at least six air changes within the room per hour, and electric wiring and equipment approved for Class I, Division 1 locations.
- d. Storage in containers outside buildings shall not exceed 1,100 gallons in any one pile or area. The storage area shall be graded to divert possible spills away from building or other exposures, or shall be surrounded by a curb or dike. Storage areas shall be located at least 20 feet from any building and shall be free from weeds, debris, and other combustible materials not necessary to the storage.
- e. Flammable liquids shall be kept in closed containers when not actually in use.
- f. Conspicuous and legible signs prohibiting smoking shall be posted in service and refueling areas.

EXERCISE 1.17-N Referring to 29 CFR 1910.106, what are the emergency venting requirements for portable storage tanks of flammable and combustible liquids?

ANSWER 1.17-N Each tank is provided with one or more devices to limit internal pressure under fire exposure conditions to 10 psig, or 30% of the bursting pressure of the tank.

EXERCISE 1.17-O Referring to 29 CFR 1910.106, under what circumstances is hot work (e.g., welding or cutting) permitted in a processing plant that contains storage tanks of flammable or combustible liquids?

ANSWER 1.17-O (Any reasonable paraphrase of the following.) Only under supervision of an individual in charge who also has inspected the area to ensure that it is safe for the work to be done and that safe work procedures will be followed.

EH Resident Competency 1.17

EXERCISE 1.17-P Because you were in the vicinity and the first one to respond, what are your immediate actions?

ANSWER 1.17-P Depending on how hazardous the material is and the area is,

1. Notify emergency response personnel (e.g., call 911).
2. Assist in the first aid, care, and/or comfort to the level which you have been trained.
3. Until assistance arrives, keep onlookers and passersby away from the accident scene.

EXERCISE 1.17-Q What is the proper classification of this event, and why?

ANSWER 1.17-Q Unusual occurrence, because of loss of life and violation of federal (OSHA) safety requirements.

EXERCISE 1.17-R What are the requirements for oral and written notification by the site/facility to DOE for unusual occurrences?

ANSWER 1.17-R From DOE Order 5500.2B: To DOE HQ EOC within two hours of categorization and in writing within 80 hours.

From DOE Order 232.1: To DOE within two hours of categorization and in writing within 80 hours.

EXERCISE 1.17-S What are the requirements for oral and written notification by the site/facility to offsite agencies (regional, federal, state, tribal, and local) for unusual occurrences?

ANSWER 1.17-S From DOE Order 5500.2B: To offsite agencies within two hours of categorization and in writing in accordance with approved agreements or unusual occurrence procedures.

From DOE Order 232.1: To offsite agencies within two hours of categorization (if DOE 5500.2B is invoked for an emergency) and in writing within 80 hours.

EH Resident Competency 1.17

EXERCISE 1.17-T Referring to paragraph (a) of Subpart I, 29 CFR 1910.132, when shall personal protective equipment be provided and used?

ANSWER 1.17-T (Any reasonable paraphrase of the following:) “Whenever it is necessary by reason of hazards of processes or environment, chemical hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.”

EXERCISE 1.17-U Referring to Chapter 8, “Personal Protective Equipment (PPE),” of NIOSH/OSHA/USGC/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, what are the primary and secondary considerations when selecting protective clothing?

ANSWER 1.17-U Primary:

- permeation
- degradation
- penetration
- heat transfer

Secondary:

- durability
- flexibility
- temperature effects
- ease of decontamination
- compatibility with other personal protective equipment
- duration of use

EH Resident Competency 1.17

EXERCISE 1.17-V Based on EPA protective ensembles, complete the following table by giving at least two examples of recommended equipment for each level of protection.

ANSWER 1.17-V

Levels of Protection Ensembles		
Level	Protection Provided	Recommended Equipment
A	The highest available level of respiratory, skin, and eye protection.	<ul style="list-style-type: none">• Positive-pressure, full face-piece, self-contained breathing apparatus, or positive-pressure, supplied-air respirator with escape SCBA• Totally-encapsulating chemical-protective suit
B	Same level of respiratory protection but less skin protection than Level A. The minimum level recommended for initial site entries until the hazards have been identified.	<ul style="list-style-type: none">• Positive-pressure, full face-piece, self-contained breathing apparatus, or positive-pressure, supplied-air respirator with escape SCBA• Hooded, chemical-resistant clothing
C	Same level of skin protection as Level B, but a lower level of respiratory protection.	<ul style="list-style-type: none">• Full-face or half-mask air-purifying respirators• Hooded, chemical-resistant clothing
D	No respiratory protection. Minimum skin protection.	<ul style="list-style-type: none">• Coveralls• Chemical-resistant, steel toe and shank boots/shoes• Gloves and goggles

EXERCISE 1.17-W Referring to 29 CFR 1926.1101, what are the permissible exposure limits (both time-weighted average and excursion)?

ANSWER 1.17-W Permissible exposure limit (PEL)

- Time-weighted average limit - no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter (f/cc) of air calculated as an eight-hour time-weighted average.

EH Resident Competency 1.17

- Excursion limit - no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter (f/cc) as averaged over a sampling period of 30 minutes.

EXERCISE 1.17-X Referring to 40 CFR 61.145, *Standard for Demolition and Renovation*, what are the required steps to prepare the regulated asbestos-containing material for disposal?

ANSWER 1.17-X (Any reasonable paraphrase of the following.) Note that there are different standards and procedures for each state.

1. Adequately wet the material and ensure that it remains wet until collected.
2. Carefully lower the material to the ground and floor, not dropping, throwing, sliding, or otherwise damaging or disturbing the material.
3. Transport the material to the ground via leak-tight chutes or containers if it has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections.
4. Double-bag and dispose in approved landfill.

EXERCISE 1.17-Y Referring to 40 CFR 61.150, *Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations*, what are the requirements for wetting and preparing asbestos-containing waste for disposal?

ANSWER 1.17-Y (Any reasonable paraphrase of the following.)

1. Wet the asbestos-containing waste material by mixing control device asbestos waste to form a slurry and adequately wet the other asbestos-containing waste material.
2. No visible emissions are discharged to the outside air from collection and processing operations, including incineration, or use of other (specified in §61.152) to clean emissions-containing particulate asbestos material before they escape to, or are vented to, the outside air.
3. After wetting, seal all asbestos-containing waste material in leak-tight containers while wet; for materials that will not fit into containers without additional breaking, put materials into leak-tight wrapping.
4. Label the containers or wrapped materials using OSHA-specified warning labels and markings.

EH Resident Competency 1.17

EXERCISE 1.17-Z Referring to 40 CFR 61.150, *Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations*, what are the requirements for processing asbestos-containing waste into nonfriable forms?

ANSWER 1.17-Z (Any reasonable paraphrase of the following.)

1. Form all asbestos-containing waste material into nonfriable pellets or other shapes.
2. Discharge no visible emissions to the outside air from collection and processing operations, including incineration, or use of other (specified in §61.152) to clean emissions-containing particulate asbestos material before they escape to, or are vented to, the outside air.